April 11, 1961 D. E. HENRIKSON 2,979,328

ELECTRICALLY OPERATED WINDOW

Filed April 25, 1957

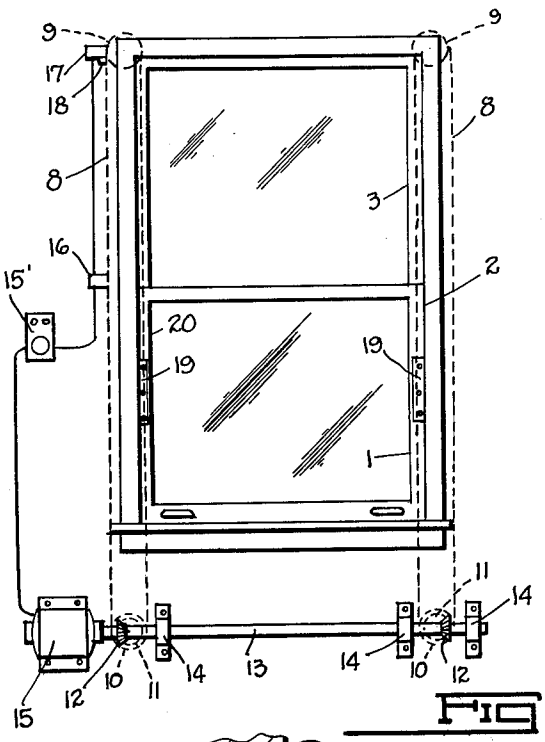


FIG 1

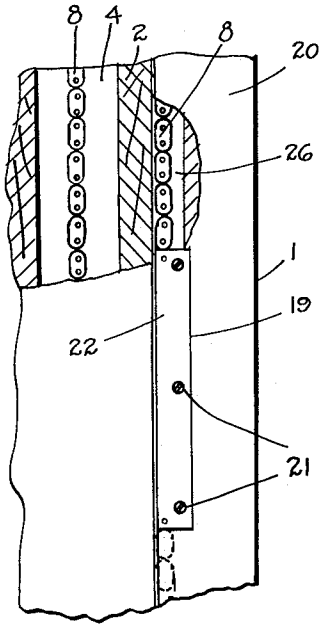


FIG 2

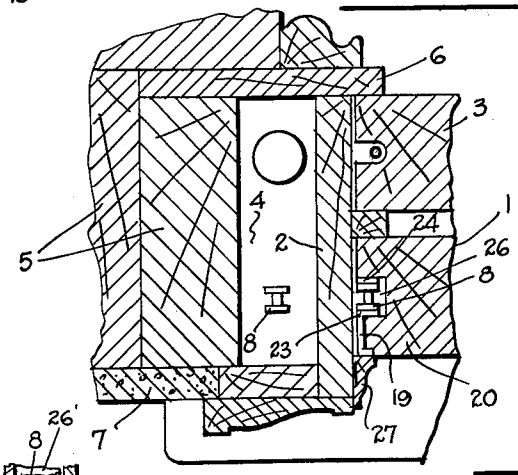


FIG 3

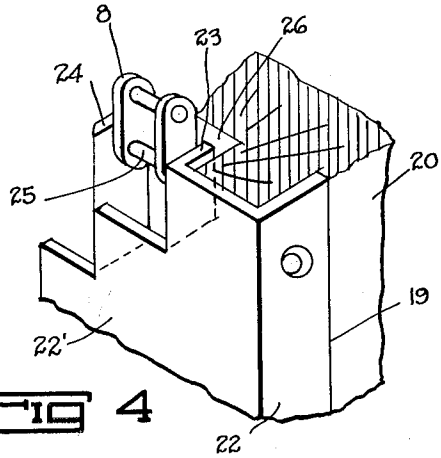


FIG 4

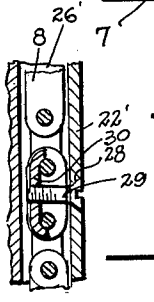


FIG 5

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United States Patent Office 2,979,328 Patented Apr. 11, 1961

2,979,328

ELECTRICALLY OPERATED WINDOW

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Filed Apr. 25, 1957, Ser. No. 655,077

1 Claim. (Cl. 268—128)

This invention relates in general to an electrically operated window and in particular to a gear and chain drive operated by a reversible electric motor and secured to the window in a new and novel manner.

In many cases it is highly desirable to have a mechanical means for opening and closing a window with an electrical drive for same so that by means of an automatic time clock as well as a manual electrical switch means the window may be opened or closed at predetermined times. This arrangement is particularly desirable on cold mornings prior to the time one must get out of bed or when one is confined to bed by illness. Such a window operating device could also be arranged to close when it begins to rain to eliminate the need to get up to close the window. Also, a remote control switch can be installed close to the bed for actuating the window.

The objects of the invention are, therefore, to provide an electrically operated window in which a motor-operated chain drive is suitably secured to a window whereby it will be moved any desired distance when the motor is actuated.

Another object is to provide such an installation in present day type windows with little or no change in the design or construction of the window.

A further object of my invention is to provide a novel connection between the window frame and the chain which will permit easy installation or removal of the window.

One more object is to provide time clock and manual switch operation of the window actuating motor as well as remote manual switch control or a remote rain actuated switch control.

Other objects and advantages as well as the construction and operation of my invention will be better understood by reference to the following specifications in connection with the accompanying drawing in which:

Fig. 1 is an elevational view of a window installation with electrically driven window actuator, partly diagrammatic in form.

Fig. 2 is an enlarged fragmentary detail of the chain drive connection to the window stile.

Fig. 3 is a cross sectional view through a window casing showing the chain drive and connection.

Fig. 4 is an enlarged fragmentary isometric view of one end of the chain connector for the window.

Fig. 5 is an enlarged fragmentary vertical cross sectional view of a modified form of chain securing means.

Referring now to the drawing by numerals of reference 1 designates a lower window sash mounted for vertical movement in the jambs 2, the upper window sash 3 being mounted and operated in the normal manner as only one window unit need be electrically operated.

The sash weight opening 4 is formed in the conventional manner by studs 5, outside sheathing 6 and inside lath and plaster 7. Operating in each sash weight opening is a chain 8 on suitably mounted upper sprocket 9 and around lower sprocket 10, the latter being driven by bevel gears

11 and 12. Gears 12 are mounted on shaft 13 suitably carried in bearings 14 and driven by a reversible motor 15 having suitable speed reducing means.

The motor may be connected to a power source through time clock and manual control switch 15' which may be located in any desirable location but preferably near the bed of the occupant of the room so it can be manipulated without the necessity of getting out of bed. Limit stop switches 16 and 17 are provided in close proximity to one of the chains on which a contact member 18 is provided.

One of the primary features of my invention is the chain bracket 19 by means of which the chains are fastened to the window. The bracket is substantially L-shaped in cross section and is recessed into the window stile 20 and secured thereto by fastening members 21 passing through front leg or flange 22.

At the upper and lower ends of each bracket 19 are flanges or ears, 23 and 24, formed from the leg 22', a pin 25 passing through the ears and through the end links of chain 8. The stile has a vertical recess 26 in which the chain and ears are received. When the fastening members 21 are removed the window can be moved clear of the brackets and then removed from the frame. In order to do this the sash stop 27 is first removed. It is to be noted that the sash stop completely covers the bracket 19 which is of slightly less width than the sash stop. When the window is removed for repairs or any other reason it is placed back into the frame clear of the brackets 19 and then slid into place with the brackets aligned with the recesses in which they are secured, the entire control system again being in perfect alignment.

The motor 15 with shaft 13, bevel gears 11 and 12 and sprockets 10 may be located in a framed and panelled section below the window for easy installation and easy accessibility for adjustments and repair if necessary.

In Fig. 5 I have shown a modified form of chain holding means in which chain 8 fits in already existing groove or recess 26' and countersunk openings 28 are provided in leg 22' of the bracket 19, fastening members 29 passing through said opening 28 and between the links and pins of the chain to threadedly engage plate 30 which snugly fits between the side members of the links and may curve over the link pins. When the chains and brackets have been assembled, the window may be placed in the window frame with the chains 8 in place in the grooves 26' and the brackets 19 assembled in the manner previously explained.

From the foregoing it will be seen that I have provided a relatively simple and effective arrangement for manual or electric automatic and time clock control of a window sash and a novel means for connecting an operating chain to the window sash to permit removal of said sash for the repair thereof or of the glass therein.

Obviously, changes in form, proportion and details of construction may be resorted to without departing from the spirit of my invention, and I reserve all rights to such changes as come within the scope of these specifications and the claim which follows.

What I claim as new and desire to secure by letters patent is:

In an electrically operated window including a window sash and stops for the sash, an actuating means including open ended chain drives, a connecting member mounted on each side of the sash comprising an angular bracket, a vertical chain receiving slot in each side stile of the window sash, a longitudinal flange on the front edge of the bracket to receive members for fastening the bracket to the window, a set of upper and lower flanges at the rear edge of the bracket receiving the ends of the chain, said last mentioned flanges projecting into the chain receiving slot and being spaced to receive the chain

therebetween, the flanges being formed from the bracket material, the rearmost flange being greater in length than the next closest flange.

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